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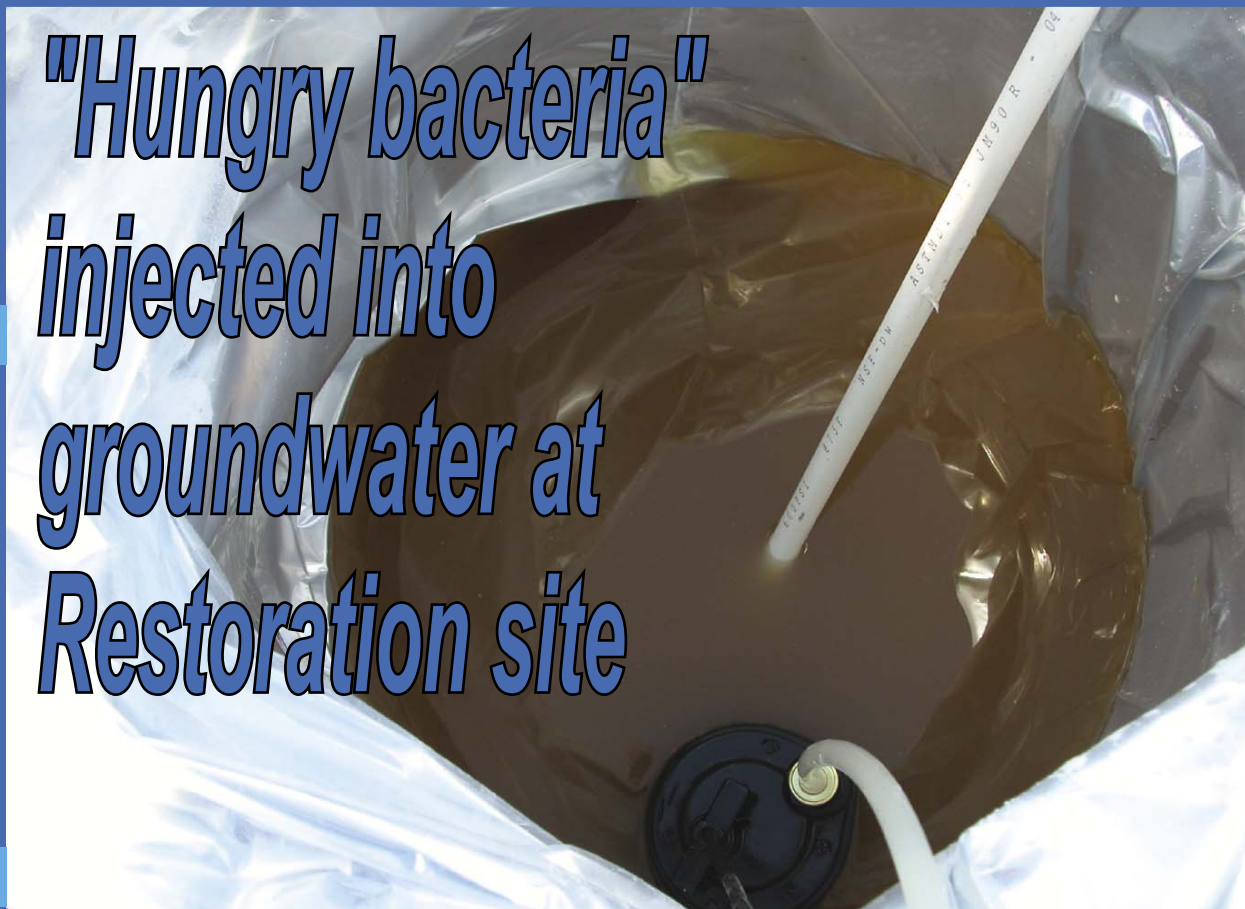
# Report to STAKEHOLDERS

<http://www.edwards.af.mil/penvmng/index.html>

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Al Duong, who has a little over a decade of experience with restoration, is the new Restoration Branch Chief. He replaces David Steckel.

*"Hungry bacteria"*  
injected into  
groundwater at  
Restoration site



6

The Mojave Environmental Educational Consortium (MEEC) held a workshop at Environmental Management (EM) in February. The workshop was created for teachers, who took a special curriculum back to the class with them. Student tours were also given by EM, which is one of the MEEC sponsors.



## FEEDING TIME

The Environmental Restoration Program (ERP) has been conducting a pilot study at Site 86 to determine if a solution of commercially available bacteria is capable of cleaning up trichloroethene, or TCE, at South Base. The bacteria become active once mixed with dextrose and will eat and live off of the contaminant.

Q.

What is a Proposed Plan? Is it a part of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)?

A.

A Proposed Plan is part of CERCLA. It is a cleanup strategy prepared by the Air Force, along with federal and state regulators, that is subject to public comment for a period of time.

A Proposed Plan usually has a public comment period of 30 days. During that time a public meeting or meetings are held in surrounding communities to inform the public of what cleanup activities are proposed, and the one that is preferred.

In 2005, the Edwards Air Force Base (AFB) Environmental Restoration Program (ERP) had one Proposed Plan for Operable Unit (OU) 6 at the NASA Dryden Flight Research Center. This year, five OUs will be moving ahead in the CERCLA process. The OUs that are tentatively set for a Proposed Plan are OU4/9 South Air Force Research Laboratory (AFRL), OU2 South Base, OU4/9 Soils — located at AFRL, OU1 Main Base and OU7 Chemical Warfare Materiel.

The OU4/9 South AFRL Proposed Plan has already come to light. The public meetings were held in April. The public comment period began in April and ended in May.

The Proposed Plan schedule for the remainder of the OUs on base are as follows and are subject to change: AFRL OU4 Arroyos in January 2007, OU9 Northeast AFRL and Mars Boulevard in July 2007, OU7 Basewide Miscellaneous in January 2008, OU8 Northwest Main Base in June 2008 and OU5/10 North Base in October 2008.

RTS

If you have a question about the Edwards Air Force Base Environmental Management program, you may address it to Stakeholders Forum, Attn: Gary Hatch or Miriam Horning, 5 E. Popson Ave., Edwards AFB, CA 93524-8060, or send e-mail to:

95 ABW/PAE@edwards.af.mil

## Next RAB Meeting

**May 25, 2006**

**5:30 p.m.**

**Mojave**

**Mojave Veteran's Building  
15580 "O" Street**

**The public is invited.**

*Report to Stakeholders* is a publication of the Edwards AFB Environmental Management Division. Its purpose is to inform and educate the public, base workers and residents about continuing Environmental Management efforts at Edwards AFB. It currently has a circulation of 6,000, including about 2,000 subscribers.

Contents of the *Report to Stakeholders* are not necessarily the official view of, or endorsed by, the U.S. government, the Department of Defense, or the Department of the Air Force.



Commander 95th Air Base Wing..... Col. Drew D. Jeter  
Base Civil Engineer..... James Judkins  
Division Chief Environmental Management..... Robert Wood  
Branch Chief Environmental Restoration..... Ai Duong  
Branch Chief Environmental Conservation..... Gerald Callahan  
Branch Chief Environmental Quality..... Robert Shirley

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Comments or questions should be directed to: Gary Hatch, 95 ABW/PAE, 5 E. Popson Ave., Bldg. 2650A, Edwards AFB, CA 93524-8060, (661) 277-1454. E-mail: 95 ABW/PAE@edwards.af.mil

*Report to*  
**STAKEHOLDERS**





# Air Force studies bacteria injection to see if it will clean up TCE contaminant

**T**he Environmental Restoration Program (ERP) injected engineered micro-organisms or bacteria into Site 86, located at South Base, in February to find out if these micro-organisms will eat, thereby destroying, contamination in the groundwater.

The micro-organisms or bacteria are not capable of causing disease or illness in humans.

The water level during the injection rose two feet, which is good in the fine silt and sand underneath South Base, technicians said.

“The ideal would be a coarse sand aquifer where the water level rises a little less,” said Thomas Doriski, a contractor for the ERP, who is working on this particular site. “The slight mound that formed in February was beneficial because it provided a gradient, which would move the injected microbes outward from its starting point. After injection, the microbes continue to migrate radially a short distance in the aquifer — usually 10 to 15 feet under the influence of the concentration gradient.”

“Our plan is to use this injection test to determine if it will be a suitable technology to clean the groundwater contamination,” Program Manager Rebecca Hobbs said. “We’re currently scheduled to install the final remedy at Site 86 in October 2007.”

Site 86, along with Site 76, are moving forward in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Both sites contain localized areas of TCE. In the Proposed Plan, which is tentatively scheduled to be ready for public review this year, cleanup alternatives for both of these sites will be discussed.

“We are monitoring the groundwater at Site 76,” Hobbs said. “The pilot test is being performed at Site 86 to determine if the technology is appropriate for sites with TCE only in the groundwater. The Proposed Plan allows us to evaluate technologies and to propose final remedies for all of our contaminated sites.”

The CERCLA process requires federal facilities, such as Edwards, to clean up haz-



**STIRRING IT UP** — Thomas Doriski, an FPM engineer, stirs dextrose monohydrate into a solution containing engineered microbes. The dextrose activates the micro-organisms. Once mixed, the engineered bugs are injected into the groundwater to eat TCE.

ardous materials to a degree that is determined to be protective of human health and the environment.

The objective of the pilot test at Site 86 is to evaluate the effectiveness of a commercial bioremediation product, a cleanup tool using microbes. CL-Out®, the solution used in this test, is an all-natural product comprised of patented strains of freeze-dried *psuedomonas* bacteria cultures to clean

up the sites’ groundwater plumes, which are contaminated with TCE. CL-Solutions came up with the idea and uses CL-Out® as a trade name.

This type of bacteria can be found abundantly as free-living organisms in soils, fresh water and marine environments, and in many other natural habitats. They may also be found in association with plants and animals and normal flora.



**ALL GONE**  
All of the solution was injected into the groundwater at Site 86 in about 10 minutes.

RTS



## Ai Duong returns to Environmental Restoration Program as branch chief

**T**he Restoration Branch at Environmental Management (EM) received a new chief in February.

Ai Duong, who brings 12 years of restoration experience under his belt replaced David Steckel — whom he worked with and under.

Prior to becoming the branch chief, he worked with the Environmental Quality Branch as the lead for air, water and solid waste programs and has been attending the University of California, Irvine (UCI) on

a government program known as long-term full-time training. He will receive his master's in business administration (MBA) in June.

As branch chief, Ai is a firm believer of communication, emphasizing that it's an important skill for the long-term success of the ERP. He oversees the cleanup of hazardous waste from past operations at Edwards Air Force Base (AFB). However, he isn't the only one handling these projects. He relies on five restoration program managers

to monitor the 471 cleanup sites on base. These cleanup sites follow the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) process. CERCLA is also known as Superfund and was established at Edwards AFB when the base was placed on the National Priorities List in the early 1990s. The Air Force signed a Federal Facility Agreement (FFA) with the state and federal regulators agreeing on a timeline for cleanup of sites.

"A restoration project can have a lifespan



of three to five years, with a total budget of \$5-10 million average," Ai said. "The program managers work with their contractors to ensure their projects stay on budget and finish on time. It's a big responsibility, with the stress level being directly related to how many projects are being managed at once."

Ai has come to understand this type of responsibility. Before he transferred to the Environmental Quality Branch he was in charge of the ERP budget and was responsible for several cleanup sites and projects.

Having been a program manager, he knows that his role as branch chief is an important one. The position has been vacant for several months, which is why he's quickly trying to get up to speed on the team's workload.

"The program managers have been doing a great job on their own, but it's tough to work as a cohesive team without a leader," he added. "I'm here to act as a sounding board, to facilitate collaboration between team members and ensure they get the tools they need to get their jobs done. The program managers should be free to concentrate on their individual programs."

Ai's primary goal is to bridge any gaps between the ERP, the federal and state regulators as well as the contractors.

Over the last 15 years Edwards AFB and its regulators have had a solid relation-

ship because of the open communication. "I hope to carry on what has already been established by people like Robert Wood and David Steckel before me," he said. "There must be collaboration between the Air Force and its regulators. We cannot just look for a solution that works for the Air Force. Any proposal or change of plan must be approved by all of the parties involved, not just one or two."

Ai considers the public to be one of the integral pieces to the base's cleanup approach. He sits on the Restoration Advisory Board (RAB) as a remedial project manager (RPM). The majority of RAB members are public citizens appointed by their communities. The board provides two-way communication between the public, Air Force and regulators.

"Edwards has a long-standing relationship with the RAB," he said. "I want to continue our practice of open communication. The RAB members are the eyes and ears of the base and surrounding communities. If they have a concern, we need to know about it." Other RPMs include regulators from the U.S. Environmental Protection Agency (EPA) and California EPA – one from the Department of Toxic Substances Control and another from the Lahontan Regional Water Quality Control Board.

Not only is Ai the Restoration Branch

Chief, but he is also the Financial Business Officer for Environmental Management. As the Financial Business Officer, he juggles the budgets for the Conservation Branch and the Environmental Quality Branch as well as his own branch. The added responsibility suits Ai, who has a knack for numbers and accounting. "I discovered a hidden strength when I worked on the Restoration budget three years ago," he said. "The experience encouraged me to pursue a master's degree in business administration."

The one-year time restraint at UCI under the long-term full-time training program has forced Ai to double his academic efforts. He worked through the summer to finish as many credits as possible. Currently, he is finishing the rest of his courses while working full-time at Edwards AFB. The switch from employee to student and back again has Ai feeling a little dizzy. "It felt odd to go back to school full time," he added. "There's a different rhythm to academic life and I had to get into the groove. Now I'm trying to adjust to being back at work."

Ai finds comfort in the fact that he's surrounded by people who make the transition easier. "I've been out of the cleanup business for a few years and some things have changed. But one thing remains constant at Edwards AFB. The people I work with make all the difference."

RTS

### THE BOSS

*Ai Duong looks at a document in his office. Duong served 12 years under the ERP before transferring to the Environmental Quality Branch and attending school to get his master's degree in business administration. He returned to the ERP in February as branch chief.*





**ALWAYS TIME TO LEARN** — Collaborating with the Mojave Environmental Education Consortium, Environmental Management (EM) held a workshop for teachers, which included touring the base wastewater reclamation site, left. The teachers were also given a presentation on how EM works with the base mission and a curriculum to use in class.

## Teacher workshop, student tours focus on environmental know-how at Edwards AFB

**W**ith plenty of environmental know-how to share, Edwards Air Force Base (AFB) recently opened its doors to 400 students and their teachers looking for knowledge about real-world environmental efforts. Joining the Mojave Environmental Educational Consortium (MEEC), which enhances educators' knowledge of environmental subjects, Edwards AFB hosted a teacher workshop and a series of student tours for local schools in Palmdale, Victorville, Adelanto and other Mojave Desert communities surrounding the base.

The consortium coordinates these activities with businesses that have ongoing environmental programs and are willing to share information to help students prepare for jobs in environmental fields and provide teachers with practical lessons on environmental subjects. The educational events were held at Edwards AFB in February, March and April.

The MEEC environmental education program began February 22 with local teachers attending a free workshop on water reclamation and conservation presented by Environmental Management. Workshop participants had the opportunity to learn about the water reclamation process first hand during a tour of Edwards AFB's state-of-the-art reclamation plant, where thousands of gallons of water are recycled daily for nondrinking use.

The workshop was provided to help educators teach their

students about the water reclamation process and its importance in insuring adequate water supplies for the desert's future. Participants were able to enhance their knowledge about this and other water education topics by participating in hands-on educational activities gleaned from the Project WET Curriculum and Activity Guide for grades K through 12. Each workshop participant received a copy of the standards-based guide, which contains over 90 innovative, interdisciplinary hands-on learning activities aimed at promoting water awareness and stewardship in the classroom.

The teacher workshop was followed over the next several months by a series of tours for students. Visiting Edwards AFB for a day, students learned about a range of environmental efforts at the base, from protection of natural and cultural resources by biologists and archaeologists to preventing pollution and restoring the environment by engineers, chemists and technicians. They also saw demonstrations and heard about the education it takes to work in the various environmental fields.

The workshop and tours were co-sponsored by Edwards AFB and the consortium, a partnership which links educators with high-quality environmental education resources free of charge. For more information, visit MEEC online at [www.meeconline.com](http://www.meeconline.com) RTS



# Columbia Middle School students learn about Edwards environment



Larry Lewis, a math teacher from Columbia Middle School, located in Adelanto, Calif., arrives at the Environmental Management (EM) lobby with students. These students were able to learn about what EM does as a part of the Edwards Air Force Base mission and toured the NASA Dryden Flight Research Center.



Biologists were able to talk about the desert tortoise, which is a federally listed threatened species. Students also learned about local-area snakes like the Mojave green rattlesnake.



A couple of students from Columbia Middle School take a look at how flint knapping works. An archaeologist was available to demonstrate the flint knapping process.



Base Environmental Analytical Laboratory, or BEAL, Senior Chemist Kevin Hoang serves liquid-nitrogen ice cream to Columbia Middle School students.

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Published data and documents relating to the Environmental Restoration Program are available for public review in information repositories at four locations. The current information repositories are located in the cities of Boron, Lancaster and Rosamond, as well as Edwards AFB. They are updated when new documents are released.

If you have any questions about information in the repositories, please contact Gary Hatch, Environmental Public Affairs at (661) 277-1454 or through e-mail at 95 ABW/PAE@edwards.af.mil.



Location	Days and Hours of Operation	
<b>Edwards AFB Library</b> 5 W. Yeager Blvd. Building 2665 Edwards AFB, Calif. (661) 275-2665	Mon-Thurs	9:30 a.m. - 7 p.m.
	Fri	9:30 a.m. - 6 p.m.
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<b>Kern County Public Library</b> Wanda Kirk Branch 3611 Rosamond Blvd. Rosamond, Calif. (661) 256-3236	Tue & Wed	Noon - 8 p.m.
	Thurs-Sat	10 a.m. - 6 p.m.
<b>Los Angeles County Public Library</b> 601 W. Lancaster Blvd. Lancaster, Calif. (661) 948-5029	Mon-Wed	10 a.m. - 8 p.m.
	Thurs & Fri	10 a.m. - 5 p.m.
	Sat	11 a.m. - 5 p.m.
<b>Col. Vernon P. Saxon, Jr. Aerospace Museum</b> 26962 Twenty Mule Team Road Boron, Calif. (760) 762-6600	Mon-Sun	10 a.m. - 4 p.m.



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